



Marine hazard evaluation for the coasts of Catania and Siracusa, eastern Sicily, Italy, and implication for a local sea monitoring system

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A project for the planning of a coastal defense system for the provinces of Catania and Siracusa, in Sicily, is in the stage of feasibility analysis at the Building and Construction Interdepartmental Center for Industrial Research (CIRI), of the University of Bologna, with the focus on protection against extreme waves, such as tsunamis and storm waves. The eastern coast of Sicily, encompassing the coasts of Catania and Siracusa, is one of the most hazardous areas in Italy and in the Mediterranean as regards tsunamis, and it is also affected by extreme sea storms. The main goal of the project is to study the feasibility of a local Tsunami Warning System addressing near and far sources of seismic and landslide origin and to plan a sea-monitoring system capable to detect anomalous conditions for a wide spectral range of waves covering tsunamis as well as storms.

The first phase of the project is the hazard assessment for extreme events, which is preparatory to the second phase, i.e. the feasibility study of a sea level and sea currents monitoring system based on new technologies.

The coastal hazard assessment includes the identification of possible tsunami sources and the estimation of the tsunami threats, which allows one to recognize the most exposed coastal areas to tsunamis events. The identification of tsunami sources is made from literature and catalogs, while the use of numerical simulations of tsunamis is needed for tsunami hazard assessment and to evaluate the coastal inundation. The tsunami simulations are also a key information for the planning of the monitoring network, since it allows to characterize the signal that should be detected.

As regards storm waves, we propose to extend the temporal base for the estimation of the significant wave height and other relevant statistics with the use of geophysical data, since recent works from literature suggest that the actual statistics for eastern Sicily might be underestimated.